REPORT 80

SWEEP

SOIL AND WATER

ENVIRONMENTAL

ENHANCEMENT PROGRAM

PAMPA

PROGRAMME D'AMELIORATION

DU MILIEU PEDOLOGIQUE

ET AQUATIQUE

Canada

Ontario

SWEEP

is a $30 million federal-provincial agreement, announced May 8, 1986, designed to improve soil and water quality in southwestern Ontario over the next five years.

PURPOSES

There are two interrelated purposes to the program; first, to reduce phosphorus loadings in the Lake Erie basin from cropland run-off; and second, to improve the productivity of southwestern Ontario agriculture by reducing or arresting soil erosion that contributes to water pollution.

BACKGROUND

The Canada-U.S. Great Lakes Water Quality Agreement called for phosphorus reductions in the Lake Erie basin of 2000 tonnes per year. SWEEP is part of the Canadian agreement, calling for reductions of 300 tonnes per year — 200 from croplands and 100 from industrial and municipal sources.

PAMPA

est une entente fédérale-provinciale de 30 millions de dollars, annoncée le 8 mai 1986, et destinée à améliorer la qualité du sol et de l'eau dans le Sud-ouest de l'Ontario.

SES BUTS

Les deux buts de PAMPA sont: en premier lieu de réduire de 200 tonnes par an d'ici 1990 le déversement dans le lac Erie de phosphore provenant des terres agricoles, et de maintenir ou d'accroître la productivité agricole du Sud-ouest de l'Ontario, en réduisant ou en empêchant l'érosion et la dégradation du sol.

SES GRANDES LIGNES

L'entente entre le Canada et les États-Unis sur la qualité de l'eau des Grands Lacs prévoyait de réduire de 2 000 tonnes par an la pollution due au phosphore dans le bassin du lac Erie. PAMPA fait partie de cette entente qui réduira cette pollution de 300 tonnes par an — 200 tonnes provenant des terres agricoles et 100 tonnes provenant de sources industrielles et municipales.

TECHNOLOGY ASSESSMENT PANEL

FINAL REPORT OF THE TECHNOLOGY ASSESSMENT PANEL (TAP) SUB-PROGRAM OF THE SOIL & WATER ENVIRONMENTAL ENHANCEMENT PROGRAM

(SWEEP)

March 1993

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London, Ontario

On behalf of: Agri-Food Development Branch
Agriculture Canada
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Disclaimer: The views contained herein do not necessarily reflect the view of the Government of Canada or the SWEEP Management Committee.

ACKNOWLEDGEMENTS

The **TECHNOLOGY ASSESSMENT PANEL** (TAP), a sub-program of SWEEP, is useful if it helps other sub-programs, individually and collectively, to achieve more meaningful results. During the course of its existence, TAP has worked with nearly all sub-programs of SWEEP, helping and being helped. The authors, on behalf of TAP members would like to acknowledge the help that they have received from other sub-programs and to express thanks for the same. Hopefully, meetings and contacts have been mutually beneficial.

TAP has been composed of up to 15 appointed members whose names appear elsewhere in this report. Other regular attenders at TAP meetings have been: Helen Lammers-Helps of the Conservation Information Bureau; Rimi Kalinauskas of Environment Canada, some members of the Technology Transfer Committee, principally Adam Hayes, Lisa Cruickshank, Brent Kennedy and Keith Reid, and some members of the Working Committee of SWEEP, such as Galen Driver, Howard Lang, Wallace Findlay, Greg Wall, Fred Mooney, Robert Anderson, Gary Nelson and Michael Hicknell. All of these persons have directly or indirectly assisted with the work of TAP.

Special mention has to be made of the Executive Committee: Arthur Bennett, Bruce Shillinglaw, William Kilmer and the Scientific Advisor for TAP, Michael Hicknell of Ag-Canada, Guelph. They were all there when TAP was formed, they were there at the final meeting, they have been at most TAP events in between and they have all spent many extra volunteer hours working on behalf of TAP and SWEEP and Conservation.

Art Bennett served as the first Chairman until the end of 1988 and has remained on the Executive as Past Chairman. Bruce Shillinglaw, a member of the original Executive, became Chairman when Art retired from the position. Bill Kilmer was elected Vice-Chairman. They have been a powerful, hard-working, conscientious trio.

Mike Hicknell has been scientific authority for TAP since it was formed. Immediately prior to that, in the summer of 1986, Mike came to Ag Canada from the Department of Indian Affairs. As scientific authority he has been responsible for TAP ever since. Seldom has he missed a TAP event. Always, he has been quick to tackle and complete every part of the program that was his responsibility. The work of TAP would have been more difficult and results less favourable were it not for the Scientific Advisor.

The Executive, Panel Members and other associated with SWEEP have provided the information for this report.

Herb. G. Norry, P.Ag.
London, Ontario

TECHNOLOGY ASSESSMENT PANEL OF SWEEP

MEMBERS AND FORMER MEMBERS

■•Arthur Bennett	First Chairman
■•Bruce Shillinglaw	Second Chairman
■•William Kilmer	Vice-Chairman
■•Michael Hicknell	Scientific Authority
■•Herb Norry	Executive Secretary

•Douglas Albin
•Charles Baldwin
•Barbara Bolton
•Max Colwell
■•Richard Coote
■Ronald Costen
Diane Dubois
•Sharm Fossenier

■Michael Goss
Stephen Henderson
Norris Hoag
Gary Kachanoski
Bev D. Kay (Hon)
Donald Lobb (Hon)
Rob J. McLaughlin
•Murray Miller

■•James Myslik
■Clinton Pottruff
■•Jack Rigby
■Len Senyshyn
Sam Singer
■•Lars Skjaveland
■Donald Taylor
■•Susan Weaver

■ Current
• Original

EXECUTIVE SUMMARY

The Soil and Water Environmental Enhancement Program (SWEEP) is a coordinated federal/provincial program to deal with soil conservation and water quality. As part of a Canada/US Agreement to reduce the phosphorous loading to Lake Erie, Canada accepted the goal of reducing its phosphorous loading to the lake by 300 tonnes per year, 200 of which would be from agricultural sources. The reduction of 200 tonnes was the responsibility of SWEEP. The beginning of the SWEEP program was announced in August 1985 and the agreement was signed in May, 1986. Several sub-programs were established under SWEEP.

Formation of TAP: One of the sub-programs of SWEEP was the Technology Assessment Panel (TAP) which came into being in August, 1986 when panel members were appointed by the Honourable John Wise, Minister of Agriculture. When no vacancies existed, the Panel was composed of seven farmers, one person from the Ontario Agricultural College, three from agribusiness, three from Agriculture Canada and three from the Ontario Ministry of Agriculture and Food. An Executive Secretary, Herb Norry, under contract, was provided by Agriculture Canada.

Functions: TAP had several functions, one of which was to provide peer group comments for management, which term includes program managers. Comments were basically about technologies - needs, availability, usefulness, strengths, weaknesses, erroneous perceptions, research needs, research results, etc.

TAP members were a network by themselves. Each of them belonged to many other networks, many of which involved persons very interested in conservation. Ideas that could be of benefit to SWEEP managers were picked up from hither and yon. It would have been a mistake not to pass on to managers, ideas that might improve the SWEEP program. The result was that while TAP concentrated on technologies in their study and searchings, they passed on to managers any and all ideas that might be of benefit to the SWEEP program.

Process: Peer group comments were conveyed to management in a variety of ways. Managers were welcome to attend all TAP meetings and many did. Notes taken at TAP meetings went to managers. Managers had an open invitation to present information to TAP or request comments from TAP. Program managers took part in TAP tours and fact-finding missions. TAP tried to have the panel represented at events sponsored by other programs. Informal conversations when at meetings or on tours and direct telephone calls were found to be excellent means for managers and TAP members to exchange views.

Results: Since TAP is a service program, it is successful only if it aids in the success of the SWEEP program. It is successful if it provides managers, including program

managers, with information and viewpoints so that they are able to make better decisions and thereby achieve more success in programs.

How well has TAP succeeded in helping managers? In a period of seven years, it is likely that TAP pleased at times and displeased at times. Hopefully, there were more of the former than the latter. TAP has asked management at times, "Tell us what you want us to do?" The standard answer, reassuring to TAP, has been "Keep on doing what you are doing in the same way."

Since TAP has been successful only if it has helped in the overall success of SWEEP, and since TAP does not want to lay claim to pockets of success, nor repeat results that are better reported elsewhere, we asked our members and close associates to tell us some of the things about SWEEP that they though should be recorded. Some of the points raised by members are about accomplishments of SWEEP and some are about groups or individuals responsible for the accomplishments of SWEEP.

Accomplishments of SWEEP: One TAP member told us that the attitudes of farmers, researchers, extension workers, etc. have been changed by the process of participation in SWEEP programs. This most important accomplishment of SWEEP will not likely show up in SWEEP reports. New partnerships have been formed and individuals have greater respect for other stakeholders.

An increased interest in conservation in farm communities is another benefit noted. Younger farmers, in particular, have great interest in trying new conservation technologies. There is debate as to whether this interest is caused more by perceived conservation benefit or perceived profitability. The cause is immaterial.

Tillage 2000 was a great program that has received much well-deserved favourable comment - Many believe that future use should be made of some of these sites.

Increased cooperation between the many stakeholders involved in SWEEP has been mentioned often and enthusiastically. This could well be one of the most beneficial unplanned side-benefits of SWEEP. Cooperation between farmers, agribusiness, researchers, Ag Canada, OMAF, Environment, Conservation Authorities, etc. has been excellent. Hopefully, such will continue.

On farm research has been made more prominent and more acceptable as a result of SWEEP. Well conducted research on farms complements the research that is conducted in laboratories and in small plots at research stations and elsewhere.

OMAF appointed 26 Soil Conservation Advisors to assist in the SWEEP Program. These advisors increased their knowledge as they worked on conservation projects. In the government services or elsewhere, these people are a powerful potential for leadership in conservation efforts.

Some of the Soil Conservation Advisors became the Technology Transfer Committee of SWEEP. Their accomplishments through that committee are highly commendable. Some aided in the writing of Best Management Practices publications which puts into writing some of the good extension information previously not available in that form.

The Technology Transfer Committee assembled and merged the suggestions for future research as found in the SWEEP Research Reports. They and TAP have assigned priority ratings to these suggestions which are included in this report.

The Conservation Information Bureau, started as a SWEEP project, has assembled a data bank of conservation information and is in a position to service an increasing number of clients. Staff are knowledgeable about conservation practices, aggressive and cooperative. The Bureau should continue to grow and serve well.

Finally, TAP wants to join many others in paying tribute to Dr. Wally Findlay, a great war horse in the SWEEP Program. TAP members consider Wally as one of their own since he seldom missed a TAP meeting. He has been a wise, forward-pushing steadying influence in the SWEEP program.

Wally would want mention made of many other very dedicated participants in SWEEP who may have achieved less prominence in SWEEP mainly because they had less knowledge and less stature to begin with and a less prominent role to play in the program. Names of researchers, administrators, farmers, etc. leap to mind. It would be folly to start naming them.

Members of TAP, that multi-disciplinary group, with an abundance of varied talents, and plenty of esprit de corps are proud to have been associated with other participants in a successful program.

SWEEP came to an end on March 31st, 1993, when many of those who had been involved with the SWEEP program, plus some who will be involved with some subsequent programs, gathered to exchange views and opinions. A summary of this meeting is in the Appendix.

TABLE OF COMMENTS

1.0 GENERAL INTRODUCTION

The **Technology Assessment Panel** of SWEEP came into being in August 1986 when fourteen panel members were appointed by the Honourable John Wise, Ministry of Agriculture. The purpose of the panel was to provide leadership in validating new and existing technologies appropriate to Ontario conditions. The panel, which reported to the Management Committee of SWEEP, was to review, assess, plan, rank, advise, recommend and promote, but not direct or veto. It was intended that the panel would assist managers of SWEEP sub-programs by providing them with critical peer group comments.

Since TAP is a service committee, it is successful only if it has contributed to the success of the total SWEEP program; if it has contributed to the success of the other sub-programs. TAP does not intend to claim as its own any part of the success of others; nor does TAP intend to reproduce results that are better recorded elsewhere. We have asked members to give us their ideas of important parts of the whole that might be missed in other recordings or not sufficiently emphasized.

During the past seven years, TAP has had direct or indirect contact with all sub-programs of SWEEP. With some sub-programs, the contact has been much more intensive than is the case with others.

As an alternative to trying to cover everything or autocratically selecting and rejecting, the author has asked TAP members and close associates to communicate what they think has been important, where improvements could have been made, which TAP or SWEEP stories should be recorded, what should be recommended for the benefit of planners of future programs, etc. These suggestions, some written and some verbal, some to be credited to author and some to be anonymous plus comments taken from Notes of TAP meetings are the basis of this report.

The Technology Transfer Committee which has been closely connected to TAP since its conceptual stage, selected suggestions for research from SWEEP reports. These were reviewed by TAP and are included in this report.

Finally, the wrap-up meeting of SWEEP was held immediately following the final meeting of TAP. Those present included persons who had been key figures in the SWEEP program, plus some who will be involved in other conservation and environmental projects in the near future. Ideas gleaned from what was said are included in the Appendix.

2.0 BACKGROUND

During the past 30 years, there has been increasing concern about the environment. This concern has been fueled by many causes. Mankind has been polluting at an unprecedented rate. Visible signs of pollution are more evident. Modern technology has made it possible and easier to detect even minute amounts of pollution. The testing of atomic bombs has shown us that pollution in the atmosphere can be spread far and wide. People are more concerned that many ills of the world, such as global warming and increased incidence of cancer can be traced to pollution.

In the sixties, Lake Erie, the shallowest of the big Great Lakes, exhibited many signs of pollution and predictions of its imminent death were widespread. Since this lake had been one of our most bountiful sources of fish for food and pleasure and since millions of people in Canada and the United States knew the lake, the time was ripe for leaders to take action.

The International Joint Commission (IJC) took the lead in stimulating actions. Great Lakes Water Quality Agreements between Canada and the United States came into being in 1972 and in 1978. Considerable success in reducing water pollution resulted from their efforts.

Scientists decided that water pollution in Lake Erie could be reduced by lowering the phosphorous load going into the lake. Phosphorous is a nutrient needed by algae and other water polluting plant life. Reducing phosphorous was one way of reducing the plant life and, in that way, reducing pollution.

In October 1983, Canada and the U.S. signed Annex III to the 1978 agreement. This committed the two governments to reduce the annual phosphorous load to Lake Erie by 2000 tonnes. Canada's share of this was 300 tonnes, 200 of which was to be from agricultural cropland sources.

The Soil and Water Environmental Enhancement Program (SWEEP) is a federal-provincial program responsible for achieving Canada's commitment to reduce phosphorous loading of Lake Erie. The Agreement for a five year program was signed in May, 1986. As a result of delays in getting some sub-programs started, the ending of SWEEP was changed to March 31, 1993.

2.1 SWEEP AND ITS SUB-PROGRAMS

There were seven sub-programs, some of which were further sub-divided.

Sub-Program 1

- Technology Assessment Panel (TAP)
- Conservation Information Bureau (CIB) • To facilitate the exchange of information among advisory personnel and other conservation leaders in both private and public sectors as well as to gather, and disseminate soil and water conservation information.
- Socio-Economic Evaluation (SEE) • To study the social and economic issues as they relate to soil and water conservation.

Sub-Program 2

- Technology Evaluation and Development (TED) • The research arm of SWEEP; to evaluate, develop and adapt cost-effective technologies that will lead to soil conservation and improved water quality.
- Farm Level Economic Analysis (FLEA) • To evaluate the economic input of newly developed SWEEP technologies and techniques.

Sub-Program 3

- Pilot Watershed (PWS) • a large scale implementation program of tillage plans at a watershed level, to test comprehensive implementation, farmer acceptance, water quality response, and soil and crop impacts.

Sub-Program 4

- Local Demonstration • OMAF Program responsible for projects such as Tillage 2000 and side-by-side demonstrations.

Sub-Program 5

- Technical Assistance • OMAF soil conservation advisors to provide advice and encourage farmers to adopt conservation management programs.

Sub-Program 6

- Incentive Grants • to subsidize the cost of constructing on-farm projects that protect water and soil quality.

Sub-Program 7

- Administration
- Monitoring
- Public Information

2.2 FORMATION OF T.A.P.

In, October, 1985, Herb Norry was awarded a contract by Agriculture Canada to develop a long term plan for a proposed Technology Assessment Panel. This was done using, for consultative purposes, persons involved in the management of SWEEP and others who were potential members of the panel. The plan that was developed was accepted.

Panel members were appointed by Hon. John Wise, Minister of Agriculture and TAP came into being in August, 1986. Chairman of the panel was Arthur G. Bennett, P.Ag. Original members of TAP, with information applicable at the time of appointment, are shown below as is also the information about the Scientific Advisor of TAP, the Executive Secretary and later-appointed panel members.

ARTHUR BENNETT, P.Ag.

Art was raised on a farm in Grenville County in Eastern Ontario, graduated from the Kemptville Agriculture School and the Ontario Agricultural College and joined the Agricultural Representative Branch of the Ontario Ministry of Agriculture and Food. He was Director of Extension for OMAF for several years before retiring. He and his wife, Jean, reside on their farm in Huron County. He was secretary-treasurer of the Junior Farmers Association of Ontario for seven years during which years the Junior Farmer Soil and Land Use Tour was an annual event.

DOUGLAS ALBIN

Doug is a cash crop farmer near Paris. He is the Brant County representative on the Joint Agricultural Soil and Water Conservation Program and has been a cooperator with both the Ontario Ministry of Agriculture and Food and the Grand River Conservation Authority. He has had personal experience on his own farm at converting the bottom of a gravel pit back to agricultural production.

DR. CHARLES BALDWIN, P.Ag.

Charles could be called Mr. Conservation Promoter of the South-West. Since graduating from the Ontario Agricultural College in 1956, he has been involved in soil management and conservation, in teaching, extension and research. He is well known for his knowledge about and his enthusiasm for conservation, and has spoken at many meetings in Canada and the U.S.A.

BARBARA BOLTON

Barbara, and her husband, Charles, operate a 600 acres farm near Strathroy in Middlesex County. Beef cattle, corn and white beans are the main enterprises. On their farm they have adopted many soil conservation practices, such as grass waterways, tree planting and balanced crop rotations. Barbara is a graduate of the University of Western Ontario.

DR. MAX COLWELL

Max lives on a farm near Ottawa and works for Agriculture Canada where he is Chief of the Agricultural Technology Policy Section. For his M.Sc. and Ph.D. degrees, he specialized in farm management and production economics. He has undertaken research on the economics of soil issues. For a number of years he worked at the Harrow Research Station in Southwestern Ontario.

DR. RICHARD COOTE, P.Ag.

Dick is a Soil Degradation Specialist with the Land Resource Research Institute in Ottawa. Soil and Water conservation was the theme of his Ph.D. studies. He was an agricultural study coordinator for the PLUARG program which was a forerunner of the present SWEEP program. He lives on a farm near Ottawa.

SHARM FOSSENIER, P. Eng.

Sharm, from Chatham, is the President of the Ontario Centre for Farm Machinery and Food Processing Technology. This centre is active in the development of new machines for specialized purposes. Sharm, personally, is very interested in the development of system approaches to solve problems.

WILLIAM KILMER, P.Ag.

Bill is the Executive Vice-President of the Fertilizer Institute of Ontario Inc. Since graduating from the Ontario Agricultural College, Bill has been continually involved with soils and fertilizers. Before coming to the Fertilizer Institute he was an agronomist with Brockville Chemicals. He has served and is serving on numerous committees having to do with soils, fertilizers, conservation and waste management.

DR. MURRAY MILLER, P.Ag.

Murray, of the Department of Land Resource Science, University of Guelph, has been deeply involved for over 30 years with research, teaching and extension relative to soils. He has served as chairman of the Department of Land Resource Science and as President of the Canadian Society of Soil Scientists.

JAMES MYSLIK, P. Eng.

Jim, from Guelph, is an agricultural engineer with the Ontario Ministry of Agriculture and Food. He is from a farm in Kent County and a graduate in engineering from the University of Guelph. In his extension work, he has specialized in soil and water management and helped in preparing an Erosion Control Design Manual for contractors.

JACK RIGBY

Jack, a farmer from Blenheim, has been active in conservation for many years. He is a winner of the Kent County Conservation Man of the Year Award. He has been Chairman of the Rondeau Bay Watershed Agricultural Steering Committee and of the Rondeau No-Till Group. He uses soil conservation practices on his own farm and is an active promoter of the same.

BRUCE SHILLINGLAW

Bruce is a farmer from Londesboro in Huron County. He is a graduate of Guelph and, before farming, worked with Fison's in both research and sales. When President of the Huron Soil and Crop Improvement Association, he initiated the Conservation Committee and the Conservation Award Program. He uses No-Till and ridge till on his farms.

LARS SKJAVELAND

Lars, of Millbrook, is the President of Norcan Farm Equipment Ltd. of Cambridge and Past-President of the Ontario Wholesale Farm Equipment Association. Soil conservation and tillage have been his pet interests and relative to these, for over 20 years in the United States and in Canada, he has been involved with promotion, investigations and participation in meetings and conferences.

DR. SUSAN WEAVER, P.Ag.

Susan has been at Agriculture Canada's Harrow Research Station since 1978. She has conducted research on plant protection, economic losses due to weeds and the economic threshold of various methods of weed control, including crop rotation.

MICHAEL HICKNELL

Mike, born in Kitchener, is one generation removed from the farm and is a descendant of one of the first settlers to get a deed for land in Waterloo Township. Mike received a Bachelor of Environmental Studies Degree from Waterloo University in Resource Management and Conservation and from York University, a Master of Environmental Studies in Rural Planning. He was with Indian Affairs for 11 years. He has been scientific advisor for TAP since it was formed.

HERB NORRY, P.Ag.

Herb was born on a farm in Kent County and farmed there before college. He worked for OMAF for 32 years in the Agricultural Representatives Branch and as an Area Coordinator and Farm Management Specialist. Since early retirement, he has been an agricultural consultant. Under contract, he prepared an Organization and Operational Plan for TAP and has served as its Executive Secretary during its existence.

Those who were appointed later to TAP:

STEPHEN HENDERSON

When Max Colwell was given new duties by Ag Canada, Stephen Henderson was appointed to replace him. His economic background and his association with other environmental programs were valuable talents for TAP.

DIANE DUBOIS

Diane and her husband, Tom Martin, both of OAC 78, farm in Elgin County specializing in growing registered seed. They are members of First Line Seeds. Diane specialized in Environmental Biology at OAC. She is a qualified seed analyst and has set up a seed testing laboratory on their farm.

CLINTON POTTRUFF

Clinton grows over 1200 acres of corn, wheat and soybeans on his Brant County Farm. He does custom work as well. No-Till is the tillage method used on most of his fields. He has been an innovator in conservation farming for many years and is a T-2000 cooperator.

RONALD COSTEN, P.Ag.

Ron was technical manager of Chipman's Incorporation. Following early retirement he has given pest management courses all over Ontario., His experience, both as a farmer and with Chipmans has given him great practical knowledge about pests and methods of control.

DR. ROBERT J. McLAUGHLIN, P.Ag.

Rob was Executive Director of the Education and Research Section of OMAF at the time of his appointment. Previously, he had had involvement with SWEEP in the pre SWEEP days, being one of the key figures in the federal/provincial planning process. He has been a farmer, a lecturer and Head of the Department of Crop Science at the Ontario Agricultural College. He left TAP when he was appointed Dean of OAC.

SAM SINGER

Sam, when appointed, was Water Management Coordinator with OMAF. Previously he had been with MOE, Water Resource Branch, with the Ontario Water Resources Commission, and the University of Waterloo. He had spent four years with a UN team doing geological and hydrogeological mapping of the western part of Syria. He left OMAF and TAP when he became Supervisor of Groundwater Management with MOE.

LEN SENYSHYN

Len came to OMAF from MOE. Within OMAF, he specialized in the management of waste and sludge while maintaining previous interests in water quality issues.

DR. GARY KACHANOSKI

Gary replaced Murray Miller on TAP when Murray was appointed Chair of the Soil and Water Conservation Centre of OAC. A native of Saskatchewan, Gary has been one of the most powerful figures in soil conservation in Ontario, both from the research and extension points of view.

NORRIS HOAG, P.Ag.

Norris, a former Ag Rep and Director of the Agricultural Representatives Branch of OMAF, is Director of the Education and Research Section.

DR. DONALD TAYLOR

Don, a graduate of OAC, has worked with OMAF in many capacities. He started as a livestock specialist and progressed to Principal of the New Liskeard College of Agricultural Technology. He is currently Principal of the Ridgetown College of Agricultural Technology.

MICHAEL GOSS

When OMAF established and funded a Land Stewardship Chair at OAC, Michael Goss was selected as the incumbent. Michael is from the United Kingdom. Previously he had been on staff at the Letcombe Laboratories, the Rothenstead Experimental Station and the MacAuley Land Use Research Institute.

Honourary Members

DR. BEV KAY, P.Ag.

Bev was with TAP during the pre-TAP period and contributed greatly in the planning process and since. A farm boy from Victoria County, he graduated from the OAC and has been with the Department of Land Resource Science since 1969 involved in research teaching, extension and administration.

DON LOBB, P.Ag. (Hon)

Don, from Huron County, graduated from the Ridgetown College and later returned to the farm. He has been a leader in conservation ever since, seeking for and trying different conservation practices on his own farm and telling others from Ontario, other provinces and the U.S.A. about his successes and failures.

3.0 PROCESSES

What was TAP supposed to do? What did TAP Do? How was it done?

3.1 THE MANDATE OF TAP

- As found in the Organizational and Operational Plan approved in 1986 is:

(i) From the Canada-Ontario Soil & Water Quality Enhancement Agreement:

> "The Minister of Agriculture will support the establishment and operation of a Technology Assessment Panel to provide leadership in validating new and existing technologies appropriate to Ontario conditions. It will be an inter-disciplinary team made up of leading federal, provincial, university and private sector soil and water specialists as well as representatives from the farm community. The Panel will identify and provide a preliminary assessment of soil conservation technologies in terms of their validity and utility for Ontario agriculture. It will assess research results from federal, provincial, university and private sector establishments as well as international work. As a result of this assessment they may recommend technologies for immediate adoption, further evaluation, or for rejection for use in Ontario. Funding will be provided to permit the panel to cover the cost of data and information gathering, investigatory studies, seminars, conferences and travel."

(ii) The primary focus of the Panel will be on soil degradation and related water quality issues in Southwestern Ontario. Activities of the Panel may extend to related issues in other regions of Ontario.

(iii) The Panel is being set up for a five year period. At the end of the third year of operation, the Management Committee will evaluate the performance of the Panel and the extent to which it has met its mandate. The Management Committee will make recommendations to Agriculture Canada and to the Ontario Ministry of Agriculture and Food as to whether it should continue, how it should be funded, etc.

(iv) The Panel will be autonomous in that no outside person or organization will dictate the comments it will make, the decisions that it will reach, or the policy positions that it will take. While the Agreement is in force, the Panel will report to the Management Committee.

(v) The Panel will be funded by Agriculture Canada on the basis of annual work plans and budgets developed by the Panel and approved by the Management Committee and will provide to the Management Committee such information and plans as may be required to justify continued funding. Activities not covered by work plans and requiring expenditures must be approved by the Management Committee.

(vi) The Panel will review, assess, plan, rank, advise, recommend and promote. It will not direct or veto.

(vii) The Panel will maintain a continuing close relationship with the proposed Conservation Information Centre.

3.1.1 LATER CLARIFICATIONS

Issues not covered or not clearly covered in the mandate had to be dealt with during the life of the Panel. Some of these were:

1. Primary Goal: The success of SWEEP should be the primary goal of all who are working in the SWEEP program. TAP should provide management with viewpoints, ideas and information, so that Management is then in a better position to make decisions. The term management includes the Management Committee plus those who manage sub-programs.

2. Should TAP seek to reach consensus on viewpoints being forwarded to Management? No. There is nothing wrong with consensus and, where it exists, such should be indicated but it would be foolish to waste valuable time striving for consensus on every issue. A strength of TAP is the fact that members have different backgrounds and different areas of expertise and different viewpoints. A wonderful idea, presented by one member, could be completely ignored by others due to lack of time, interest, or knowledge.

   If consensus were a requirement, this wonderful idea might never be communicated to management. Funnelling information is a much better practice than filtering. The source of the opinion is also be valuable. For example, an opinion about pesticides has more weight if it comes from the TAP member who has the greatest knowledge of pesticides.

3. Should TAP be proactive? Yes, within the limits of time. TAP members are volunteers with a limited amount of time for TAP activity. Highest priority has to go to requests for assistance from Scientific Authorities and others in managerial roles within SWEEP. However, TAP would be missing opportunities to benefit SWEEP if it was not proactive in seeking out good ideas from far and wide and conveying these to management. TAP members should not be hesitant about passing on to management any idea that could improve the effectiveness of SWEEP.

4. What are the boundaries for TAP? Management answered this informally with the comment "The horizon is what you make it". The inference was that management were anxious to hear from TAP any ideas that might be helpful to SWEEP.

   TAP is a network of talented people, each of whom is tied into other networks. The eyes and ears of TAP cover a wide area. If members of TAP see or hear anything that might be useful to SWEEP managers, they should pass it on.

5. See also Appendix I prepared in 1987 following TAP discussions.

The success of SWEEP has been TAP's primary goal. All others have a lesser ranking. Providing management with unfiltered pertinent information and views has been the means used to achieve this goal.

3.2 FUNCTIONS OF TAP

In the pre-TAP discussion period, six different functions for TAP were determined and approved. Later, some of these functions were curtailed and some were expanded by mutual agreement between TAP and Management. The functions as included in the Operational Plan with later TAP comments are:

(i) The Panel will develop a comprehensive overview of soil degradation and related water quality issues in South-Western Ontario. This overview will include an assessment of research needs, the capability of extension and demonstration programs to deliver appropriate technology, the role of incentive programs and an evaluation of existing or potentially useful policy.

An assessment of research needs was urgently needed. This assessment was started in 1986 by a TAP Committee under the Chairmanship of Murray Miller (Appendix B). After the project was underway, the TED contract was signed and the newly formed Centre for Soil and Water Conservation at Guelph of which Murray Miller was the first Chairman received a TED contract for doing essentially the same thing, i.e. preparing an overview of research needs. The start that was made by the TAP committee became the first building block in the new project. TAP, like many others, participated in a TED exercise under the direction of ESP (Ecological Service for Planning, the major TED contractor) to determine more precisely the research needs that should and could be most effectively addressed by TED.

Other parts of this function had to be curtailed because the time that volunteer TAP members could devote would not have been sufficient to do the job.

2. The Panel will provide technical advice to SWEEP program managers by identifying technologies for further evaluation and by providing critical peer group comment on program and study design and on study results.

This function was the biggest of them all and the biggest part of this was " providing peer group comment". TAP's function was to provide peer group comments to the program managers or scientific authorities. The program managers assessed plans and results using the peer group comments from TAP as they saw fit.

The opportunity to get peer group comments was used by some program managers completely and enthusiastically. Other managers were less avid. The program managers, and not TAP, had the responsibility for deciding the amount of peer group comment that was desired from TAP. However, TAP had the opportunity to provide management with unsolicited suggestions. This opportunity was used without hesitation. If a TAP member had a comment that management should hear, it was relayed.

When should peer group comment take place? We asked ourselves this question often. On a continuing basis is the easiest answer. Very early in the program is a desirable time because at that stage, managers are in a better position to make use of constructive suggestions. At a TAP discussion, some members felt strongly that TAP should have opportunities to make comments very early even before Requests for Proposals are called. Because of bidding processes, such is almost impossible.

Reviews did take place at a variety of times and places, formally and informally. All research projects were reviewed on completion or shortly before. Visits to research fields provided excellent settings for peer group comments. Informal peer group review, in the evening after presentations or when travelling in a van to inspect more plots proved useful.

3. The Panel will identify where gaps exist in technology and/or activities relative to soil and water management.

This function was performed in the early days of TAP when discussions were taking place relative to the comprehensive overview of research needs. On a continuing basis, TAP members secured ideas about research needs from attending and participating in field days, seminars, workshops, tours etc. and from visiting with innovative farmers.

TAP Implementation Plans, using 1990-91 as an example, shows that five TAP members attended the Annual Innovative Farmers two-day conference; TAP members visited 13 Ontario innovative farmers; visited four farms where sustainable and/or alternative Agriculture was practised; toured the Ridgetown College of Agricultural Technology and the London Research Centre of Ag Canada and attended dozens of county, regional, provincial and American farm meetings. TAP members network with many people and bring back ideas to the panel.

4. The Panel will consider the economic or social consequences that are likely to result from the adoption of practices designed to save soil and reduce water pollution.

A number of Socio-Economic Reports, reviewed by TAP, dealt with these subjects. Some panel members, as individuals, attended meetings where these subjects were being discussed and debated.

5. The Panel will provide a preliminary assessment of current soil conservation and water quality enhancement technologies in terms of potential applicability, practicability and validity under Ontario conditions.

This function was performed by the panel on a continuing basis. The phrase under Ontario conditions caused problems because Ontario is a mosaic of conditions. Soils are different. Weather is different. Crops to be grown are different. Age and desires of farm operators are different.

6. The Panel will search near and far for technologies, practices, and ideas that may help farmers to produce more economically by reducing soil degradation.

Every year, TAP, as a group and/or individually, toured research stations, research plots, and innovative farmers' fields. In the early years of SWEEP, fact-finding missions were taken to the U.S.A - New York, Pennsylvania, Ohio, Indiana and Michigan - to find out if there were ideas that should be incorporated into SWEEP programs. Farmer members of TAP belong to the International Great Lakes Discussion Group (an organization of innovative farmer members from Canada and the U.S.A.). Ontario farmers exchange information with American counterparts and bring information gained to TAP. Problems on either side of the Great Lakes are similar and exchanging information is valuable.

3.2.1 COMMENTS FROM OTHERS ABOUT THE FUNCTIONS OF TAP

> "The TAP group was born to advise the SWEEP Management/Program people on technology that needed to be assessed. I'm not sure that's exactly what TAP did in reality. I viewed TAP as a sounding board for ideas, program initiatives and comments on projects (eg. research). TAP provided "help to management" and particularly to Agriculture Canada staff who were able to utilize TAP and seek guidance and direction. Other cooperating agencies utilized TAP less, although all agencies knew that TAP would provide the same support to them if requested."
>
> Galen Driver, Co-Chairman of the Management Committee of SWEEP

> "A major program such as SWEEP should have a varied group of people assessing its findings. This is a must if we are to truly find out how well things have been done and whether or not the data are in a useable/acceptable form."
>
> Charles Baldwin, an original TAP member

A function of TAP was to provide peer group comment to program managers. The strength of TAP was the fact that its members came from a broad base of talent pools including research, farming, extension, agribusiness and administrations. For the benefit of program managers, TAP members did assess research. Such were assessments from many different points of view just as art viewers assess art from many different points of view. While not all researchers, TAP members were level headed, practical people who could often spot flaws in the work being conducted by good researchers.

The peer group comments of TAP were for the program managers. For example, TED, SWEEP's research arm, had a competent researcher as a program manager. This program manager sought for comments from others such as TAP and fellow researchers. He assessed the research using his own knowledge and viewpoints of others.

> "TAP should be involved in commenting on projects before they are initiated; should visit each project early in its implementation to evaluate and comment on the quality of research being conducted. Two to four panel members could be appointed to monitor each project in more detail and report on progress. Two to four members could assess, as necessary, each final report before presentation. A formal format for presentation of final reports should be issued to project leaders at the initiation of projects. Progress reports should be required at pre-assigned dates".
>
> Ron Costen, a TAP member

These are more ideas for future consideration. Ron also mentioned that TAP committee members should serve for the duration of the project, that higher honoraria would be an incentive; and that provision should be made to finance worthwhile projects beyond their termination dates.

3.3 BUILDING AN EFFECTIVE TEAM

TAP was composed of volunteers who were busy people and who were already facing more demands on their time than they could meet. They had been selected because they had knowledge that would be useful to the panel and because they were sufficiently interested to be willing to volunteer their time.

We assumed that the effectiveness of the panel would be greatest if attendance at meetings was high; if many members remained on the panel for a long time; and if members were able to increase their knowledge of the subjects that would be discussed by the panel. Meeting had to be a joy rather than an endurance. The panel would work best if a strong esprit de corps was developed.

TAP was fortunate in having Art Bennett as its first Chairman. His natural talents for working with people had been enhanced by growing up with six siblings on an Eastern Ontario farm, by his work with Junior Farmer Clubs and 4-H clubs at the county and provincial level and by his 17 years as Director of Extension for the Ontario Ministry of Agriculture and Food. He is able to lead by encouraging colleagues to lead.

Practices to build an effective team were adopted. A pleasant, free atmosphere was a goal. Two-day meetings give members the opportunity to visit in the evenings. Visits to farms, research plots, research stations and other points of interest can be valuable parts of meetings. Out of province fact finding missions are better when they are composed of some from TAP and some from other parts of SWEEP. Innovative farmers, at their own expense, went on some TAP missions which was an extra benefit. TAP members were encouraged to take part in non-TAP activities such as Innovative Farmer Workshops, and County Conservation tours and meetings. It is interesting to note that of the 14 members of the panel when it was formed in 1986, 8 were still on the panel at the conclusion. If the secretary and scientific authority were included 10 of the first 16 remained until the end. Esprit de corps was high.

3.4 ANNUAL IMPLEMENTATION PLANS

This was a good requirement that applied to all SWEEP programs. A sample of TAP Implementation Plans is found in Appendix E. Each year, in September or October, the Implementation Plan for the current year was reviewed and a new Implementation Plan for the coming year was developed. The reviewing and planning exercise was a good one.

Reviewing the Implementation Plans of other programs was an annual late fall duty assigned by management to TAP. A secondary objective of this exercise was likely to give each program manager the obligation to share plans for the coming year with persons involved in other sub-programs. The process worked well.

4.0 SOME RESULTS OF THE EFFORTS OF SWEEP AND TAP

As mentioned previously, TAP has been successful only if it has contributed to the success of SWEEP and/or if it has contributed to the success of other sub-programs of SWEEP. The success of the whole is so intertwined with the success of the parts that it would be difficult and foolish to try to separate them. Views expressed herein are from TAP's perspective.

Prevalent Problems:

> "We ought to point out why we are having so many problems in farming today. Many are connected to and a result of the change to monoculture farming practices. To help combat the negative impact of these practices, corrective steps have to be taken by all of us involved in agriculture. Hence the need for conservation and protection of the environment." Lars Skjaveland, TAP member

Factors outside the control of managers often greatly influence results or perceived results and should be recorded. Some problems prevalent between 1986 and 1993 that have affected results and factors that affected assessments of results are:

1. Profits from farming have been ridiculously low. Economic survival has been a high priority for many farmers.

2. The spirit of farmers has been buffeted. Improving the farm for the benefit of a son or grandson who will farm later is no longer a driving force.

3. Weather has been particularly difficult.

4. Erosion could easily be controlled if all the fields were in sod crops or trees which is an impossibility. Low profitability of ruminant animal enterprises in the 1980's has resulted in fewer ruminants and as a result, less pasture and less forage. Increasing the number of ruminants under present economic conditions would be a slow and difficult task.

5. Woodlots and fence rows have been eliminated in rich agricultural areas. However, plantings of windbreaks and groves is occurring as a result of conservation interests.

6. Five years is far too short a time to do most soil research.

7. Results, good or bad, from major changes are usually not immediately obvious and may not be obvious for some years.

8. What works under one set of conditions does not necessarily work under another set of conditions.

4.1 RESULTS - As identified by TAP members

We asked TAP members and others associated with TAP for their comments about the results of SWEEP.

4.1.1. THE VALUE OF SWEEP

"We cannot get a true picture of the value of SWEEP from reading SWEEP reports no matter how good or how bad they may be. We might read a SWEEP research report and think that there is very little in it. Yet that report may have had a tremendous effect on people's thinking.

The Pilot Watershed Program is one example. We have not seen the reports of this study but we can see benefits that may not even be in the report. The intent of this program was to find out whether it was possible to bring about a change in thinking in a group of people, many of whom were not particularly interested in the project. This has been accomplished. Cooperators and their friends and neighbours have a much greater awareness of problems and possible solutions. Because of this awareness and interest, they will accomplish in the future much more than has been accomplished while the study has been in progress. These accomplishment will be much greater than what will be written in the reports.

The same applies to the TED program. Many TED reports have been truly outstanding. Some others have been much less stimulating. We might look at one of these latter and question what if anything has been accomplished by the study. We have to look beyond the report and think of the affect that the study has had in the rural communities.

On-farm research has been a feature of the TED program and the Tillage 2000 program. Prior to this, little research had been done on farms and farmers were seldom cooperators in the research projects. Mistakes have been made and sometimes farmers have stumbled in their efforts. Because of mistakes or stumbling, research reports of the projects may lack depth or lustre. This shortcoming may be more than compensated for by the benefits that have resulted from farmers and researchers working together.

Farmers and researchers from universities or college have cooperated in carrying out some research projects. Results have been more far-reaching than if research had been conducted in-house at colleges. The partnerships that have been developed and the changes in attitude and awareness that have occurred have been beneficial at the time and have resulted in benefits that will carry on into the future."

Jack Rigby, TAP Member

There is a lot of meat in those thoughts. Without belittling any of our research reports, we have to recognize that benefits come when good ideas are used. These good ideas may have been identified by research.

4.1.2. INCREASED INTEREST IN CONSERVATION

> "Interest in conservation has increased dramatically and much of the credit for this has to go to SWEEP programs. Great strides have been made in the acceptance of new practices. My husband and his family before him have been good, conscientious farmers. Four years ago, we did not seriously consider No-Till because we thought that it would not be suitable for our seed growing business. Now we use No-Till on most of the farm."
>
> Diane Dubois, Former TAP Member

> "The tremendous increase in the interest and enthusiasm of young farm operators is our greatest evidence of success."
>
> Art Bennett, TAP Member

A report was made at a TAP meeting (August 1986) about conservation events held in two different counties. In both cases, excellent programs had been arranged. From TAP Minutes we note "A common weakness at both of these events was the shortage of farm operators."

By contrast, attendance at conservation meetings in 1992-93 has been excellent with a high percentage being young farm operators 25-50 years old. Interest and enthusiasm has been so high that members of TAP have been concerned that too many farmers are switching too quickly and too completely to No-Till and other forms of conservation farming. They may have failures due to lack of knowledge and experience.

4.1.3 TILLAGE 2000

> "I certainly wish that someone had seen fit to continue the T-2000 plots for another five years at least. I had plots on my farm and they were great. Some benefits (or harm) from a new tillage practice do not become evident in the first three or four years. I noticed changes on my farm over the five years and I think there would have been more in the next five years.
>
> These test plots were well set up with good soil records at each bench mark. If the tillage tests had been continued, other tests could have been carried on at the same sites as in the past. Five years is really too short a period of time for soil research.

We just compared No-Till with Soil Save on our farm. Our steep hills and gravelly soil are not suited to the moldboard plough. Too much erosion from the knolls is the result. David Lobb had TED research plots on our farm and proved that erosion from hills is caused by tillage rather than water

Another farmer with a different soil type would likely use the moldboard plough as one tillage comparison. With Tillage 2000 plots, each farmer could select tillage methods that suited his soil type.

I did carry on my Tillage 2000 plot for one year on my own after T2000 ended and intended to continue, but the twitch had got pretty bad in the Soil Save plots and I was so busy with other work, that I didn't get the plot work done."

Clinton Pottruff, TAP Member

Tillage 2000 plots have been praised often and enthusiastically at TAP meetings which is an indication of the high regard that the public have had for this work. Tillage 2000 was a WINNER and many would like to see it continued. Those who conceived the idea (G. Kachanoski et al), the financial supporter (OMAF), the farmer cooperators, the researchers and the field staff who supervised plots and testing all deserve congratulations for a job well done.

It was a good idea. These plots were good sites for related research. Five years is too short a time for soil research. The project that was started has been completed but bench marks are still there, records have not been discarded, and many farmers, like Clinton Pottruff, are interested. Someone with drive and persistence may stimulate future use of these sites. In the meantime, those in charge of Tillage 2000 must feel proud when they hear the well deserved praise.

4.1.4. COOPERATION

"SWEEP was unique and long overdue in that it brought together governments, farm and industry organizations and academics to create a strong focus on land stewardship, soil conservation and water quality.

For me, TAP was an exciting forum where government managers, researchers, industry businessmen and leading innovative farmers shared ideas, debated new concepts and identified key 'next steps' in the evolution towards a greater economic and environmental sustainability. TAP was a clearinghouse for the latest technology and created opportunities for all stakeholders to be involved and to share in the success of SWEEP."

Dr. Rob McLaughlin, Dean of OAC and Former TAP Member

"In my 18 years with government, this is the finest cooperation that I have seen". Sharon McKay, Director, Agri-Food Development Branch

> "The presence of TAP contributed to the relatively smooth inter-governmental relationships. Public servants hate to have jurisdictional rivalry aired in front of the public, especially farmers.
>
> Dick Coote, TAP member.

TAP was composed of representatives from Ag. Canada, OMAF, OAC, agribusinesses and farming. The cooperation within this group has been excellent. Members often said how much they enjoyed meeting and working together for the good of conservation. Sharp differences of opinion were common and openly expressed in harmony, friend to friend. Opinions from all sides were recorded for the benefit of management because those who differ may all be partly right.

TAP members had the pleasure of interacting regularly with researchers, private contractors, government officials, and farmers in Ontario and elsewhere. They saw what can happen when all work together cooperatively and they liked it. A comment made at a TAP meeting is worth repeating, "It is amazing how much good can be accomplished if no one cares who gets the credit for the accomplishment." TAP members as a group, and individually, tried to foster greater cooperation between the many stakeholders who were trying to preserve agriculture's basic resource - the soil.

Striving for a good public image is a necessity in a democracy. Public employees, business people, farmers, etc. have to be ever aware of this, a fact which is understood by most. Fortunately this good image can be achieved by working cooperatively better than by bashing others, an idea that is still rejected by a few. Force begets force and cooperation begets cooperation.

It was a pleasure to see the honest, full cooperation between Vern Spencer and Galen Driver and their OMAF staff and the staff of Agriculture Canada responsible for SWEEP. Cooperation between Agriculture and Environment increased. Why shouldn't this be the case because good agriculturalists are good environmentalists as well. Those working on SWEEP programs, staff of conservation authorities and the Ontario Soil and Crop Improvement Association, OMAF extension advisors from various branches, farmers and researchers (public and private) worked cooperatively, partly because they had a common goal and partly because the process worked well.

Within the farm community, there is often intolerance and lack of understanding. Some aggressive profit-minded farmers who may be using too much fertilizer and other chemicals have little tolerance for organic farmers who believe that it is a sin to use chemicals of any kind and vice versa. Both extremes are dangerous.

The predominant attitude within TAP has been that farmers from one extreme to the other have good ideas and that we should be on the lookout to find and promote good ideas regardless of their source. No TAP member has adopted the extreme position that all chemicals are bad. All believe that we should be ever conscious of preserving our environment and that we should not use more chemicals than is necessary.

TAP members have faith in scientific proof. So far, it appears that economic scientific proof has been on the side of practices favoured by the profit-minded farmers. To balance this, there has been a tendency for TAP members to "bend over backwards" in their efforts to identify and promote the good points in the practices favoured by low input farmers. Keeping up-to-date on sustainable agriculture has been a priority goal. Every year some TAP members have attended conferences and visited farms and test plots featuring low input farming in Ontario and/or elsewhere. TAP members can help to bridge the gap between the extremes in the farming community.

AG Care (Agriculture Groups Concerned about Resources and the Environment) is a cooperative group investigated and approved by TAP. It is better to work cooperatively with other stakeholders rather than having to react constantly to unfair barbs from well-organized pressure groups.

4.1.5 ON FARM RESEARCH

> "One of the most positive aspects of SWEEP was the effort made to involve farmers, researchers, extension and industry personnel in all phases of the program from planning to assessing, but particularly in the active participation of farmers in the research conducted under TED and the Pilot Watershed Program. It enabled farmers to see how their dollars were being spent, and perhaps to understand a little better the mechanics of research. It also gave a boost to the Innovative Farmers group." Susan Weaver, TAP Member

The value of on-farm research to complement the research that is carried on in laboratories and at research stations, has been debated, extolled and sometimes condemned at TAP meetings. Feeling at the present time is that the well-done on-farm research projects have been great achievements of SWEEP.

Of the money spent on TED research, 77.7% was for research located on farms and another 5.5% was for research conducted partly on farms and partly at research stations. Increased research on farms appears to be the trend, at least in Canada and the U.S.A. Some research can best be carried on at research stations and some can best be carried out on farms.

Proponents of on-farm research argue convincingly that modern commercial farm equipment cannot be used effectively to till, plant, and harvest small plots and that it is very difficult to find small machines that will duplicate the work of the commercial machines. They also argue that yields near headlands are unreliable; that most land at research stations is top quality, highly fertile, and well-drained while most land on farms is not.

Those opposed to on-farm research are very concerned about lack of controls, lack of proper randomization and lack of precision, These weaknesses do not have to be associated with on-farm research. Some opponents find it difficult or impossible to give the name research to on-farm research.

TAP members at the present time are highly supportive of on-farm research. Quality of research is determined more by the researcher than by the location. T-2000 is a fine example of on-farm research because sampling of paired plots is taken at pre-arranged locations, selected to be very similar to each other on the basis of topography, soil test, etc. On farm research at T-2000 sites has been one of the great accomplishments of SWEEP.

TAP members believe that side-by-side trials are very useful in complementing other research programs if efforts are made to select paired samples well. These side-by-side trials can give indications as to where more research is needed.

TAP members become very upset when yields are taken, compared and published even when there are dozens of reasons why the results will have no meaning. This happens sometimes both with small plot research and with on-farm research. Bad researchers can mess things up regardless of location.

4.1.6. PHOSPHOROUS REDUCTION

> "SWEEP's mandate calls for a 200 tonnes reduction of phosphorous loading to Lake Erie. We have reduced our annual consumption of P_2O_5 in Ontario from about 152,000 tonnes in 1985 down to about 79,000 tonnes in 1992. This may help in phosphorous reduction in the short term. In the long term, yields may drop resulting in less profits.
>
> The main reduction in the agricultural phosphorous loading of Lake Erie had to come from reducing the runoff of phosphorous from fields into streams. Most phosphorous is attached to soil particles and a reduction of soil erosion results in a reduction of phosphorous loading. SWEEP research indicates that conservation tillage in some cases can reduce soil erosion to one-quarter of what it would be otherwise. Other conservation practices such as buffer strips along streams, grassed waterways, and filter beds can further reduce soil erosion. These practices are being adopted by farmers.
>
> In No-Till farming, the placement of phosphorous fertilizer below the surface, close to where it is needed by growing plants, will result in less phosphorous in the more erosion prone surface soil. Conservation tillage does not reduce the movement of soluble phosphorous"
>
> Bill Kilmer, TAP Member

4.1.7 RECIPES FOR CONSERVATION TILLAGE

> "There followed considerable discussion as to whether someone should be writing Ontario-based recipes for practices such as Ridge-Till and No-Till. Consensus appeared to be that some Ontario Innovative Farmers have knowledge about these two subjects equal to that found anywhere in the world. Their examples are worth following and publicizing. At the present time, no one is charged with writing recipes."
>
> TAP Minutes January 17, 1990

This was the neither the first nor the last time that the issue was raised at a TAP meeting. Some thought that this could not be done since the recipe, if we had one, would have to be modified often because of site and time specific conditions. Most thought that recipes should be written because a recipe that must be modified is better than no recipe at all.

Publications, Best Management Practices, were produced in 1992 funded by Ag. Canada and produced under the direction of AOTI with OMAF staff providing input.

4.1.8 USE OTHER CONSERVATION MEASURES

> "A lot of the thrust from SWEEP is to promote No-Till for all it is worth, presenting it as the ultimate solution. I feel that other measures such as grassed water ways, berms, catch basins, windbreaks and so on are major factors as well. Legume or grass lands, crop rotations and manure also help to keep the soil healthy, and healthy soil does not erode like compacted damaged soils."
>
> Lars Skjaveland, TAP Member

Good conservation is not one practice. It is a frame of mind. None of us should rule out the possibility that we might reject something wonderful due to lack of information or to imperfections in the procedures use.

4.2 CONTRIBUTORS TO RESULTS

4.2.1 SOIL CONSERVATION ADVISORS

> "Soil Conservation Advisors have done a tremendous amount of good in the last five years. In the years ahead, they will do a lot more. When they were first appointed, most of them were fresh out of college with little farm experience. They couldn't do much advising then but they can now. They got out into the fields and found out what was going on. T-2000 was a tremendous learning experience for them. Some are still with OMAF. Many others, are still working in conservation."
>
> Bruce Shillinglaw, Chairman, TAP

"The placement of conservation advisors and the program with which they were associated really moved soil conservation ahead. Termination of Advisor's positions (referred to as reorganization?) has cut soil conservation adrift in some areas."

Don Lobb, Honorary TAP Member

The first 12 Soil Conservation Advisors were appointed by OMAF in 1985; another 14 in 1987. Working on T-2000 plots, brushing shoulders with researchers and working closely with innovative conservation farmers and other farmers were all factors in making them very valuable advisors. Those who have left OMAF are in conservation authorities, in private companies, on farms, with the Ontario Soil and Crop Improvement Association and in the Conservation Information Bureau. OMAF and all who helped in their development can be proud of the work that they have done.

4.2.2 TECHNOLOGY TRANSFER COMMITTEE
Dealing with Mounds of Information

The subject of dealing with information was raised many times at TAP meetings. TAP members knew that much good information was being generated by SWEEP and were fearful that much of this information would remain unused because potential users did now know that it existed or because it was not in a user friendly form.

In November, 1988, before the Conservation Information Bureau came into being, one of many unscheduled discussions about the storing and transferral of information took place at TAP meetings. Comments about this discussion were made in TAP report to Management (Appendix D). TAP members were fearful that end users would feel swamped by a deluge of information, good and bad, that they could not sort out. A related fear was that there was no means of saving so-called grey literature, such as information resulting from the efforts of innovative farmers.

Fortunately the Conservation Information Bureau came into being in 1990 and staff began assembling a data bank of information relative to soil and water conservation.

The problem of dealing with a growing number of SWEEP research reports remained. TAP discussions of this problem flared up sporadically. At the January 1991 TAP meeting, Galen Driver, Co-Chair of the Working Committee of SWEEP informally volunteered to have some of his staff assist in the digesting of reports. TAP, at its next meeting, recommended acceptance of this offer.

An Ad Hoc Committee, later named the Technology Transfer Committee, co-chaired by Lisa Cruickshank and Adam Hayes came into being and held its first meeting on July 30th. Members of this committee were or had been Soil Conservation Advisors and had subject matter knowledge without which they would have had great difficulty. Committee member, Helen Lammers-Helps, provided a direct contact with the Conservation Information Bureau. Research summaries have been prepared so that information can be included in the CIB data bank.

TAP immediately invited the members of the Technology Transfer Committee to attend all TAP meetings and to participate fully in deliberations. They would be able to better prepare summaries of reports if they had been involved in the review discussions. Several TTC committee members have attended TAP meetings and contributed to discussions. Likewise, TAP has had a representative at TTC meetings. TTC prepared summaries of SWEEP reports.

The problem of dealing with volumes of information has not been fully solved. Communicating better is a task that is never finished. There are still fears that good information will remain unused; that end users will still consider the system user-unfriendly; that summaries will be considered too difficult to easily understand; that good, sound, meaty reports may not have been differentiated sufficiently in summaries from those that have little practical meaning; that end users will find the task of getting information from the data bank too difficult'; that discarding unwanted information will be a formidable task for CIB staff.

Nevertheless, progress has been made. The work that has been done by the Conservation Information Bureau and the Technology Transfer Committee has been commended often and enthusiastically at TAP meetings.

4.2.3. CONSERVATION INFORMATION BUREAU

> "Before I started in No-Till, I realized that something was wrong and that I had to make changes. I needed information because I didn't know what to do so I went looking for it but couldn't find anything here in Ontario. I then went to the States to get information, much of it from other farmers who were in the process of making changes. We have continued to get more information, bit by bit, from many sources and from our own trials.
>
> I was interested in serving on TAP and on the Advisory Board of the Conservation Information Bureau because I wanted to make it easier for other people to get accurate information of the kind that I had acquired slowly and with difficulty over a period of years.

> The Conservation Information Bureau has created a library of good information and is in a position to expand its services to clients. Clients will be mainly innovative farmers, extension workers, people from agribusiness and researchers. Mainstream farmers will likely continue to get most of their conservation information from OMAF and Agribusiness Advisory services but, indirectly, part of this will be coming from the data bank of the Conservation Information Bureau.
>
> Jack Rigby, TAP Member

TAP members:

- Heard about a proposed Information Bureau at their first pre-TAP gathering
- Discussed the pros and cons of a centre and expressed support for the concept at many meetings (Appendices B & D).
- When in Fort Wayne, Indiana, on a fact-finding mission in January, 1987, met with Jim Lake, Director of the conservation Tillage Information Centre to secure information, which was relayed to management.
- Have cooperated with the staff of the CIB on a continuing basis and, in turn, have received their full cooperation.

The staff of CIB are talented, knowledgable, down-to-earth, conscientious and aggressive. TAP has been pleased to have had a close association with them and wish them well in the years ahead.

4.2.4 FARMER PARTICIPATION

> "The farmer membership of TAP was one of its greatest strengths. Their clear superiority over the other members when it came to assessing practical issues was evident from the start. Yet they were always gracious and tolerant when dealing with the academic and bureaucratic approaches often put forward by the other members. In my opinion, their participation also gave a degree of credibility to our activities that could never have been achieved without them."
>
> Dick Coote, TAP Member

Dick said it so well. Many others made similar comments. Not only were our farmer members of TAP very valuable as individuals, but they were also tied in on a first name basis with leading farmers, researchers, and agribusiness personnel in Ontario and in many neighbouring states. Farmers were valuable members of TAP and TAP would have had very limited success without them.

4.2.5 DR. WALLACE I. FINDLAY, P.Ag.

"Wally Findlay was invaluable - practical, conscientious and courageous in setting a new course for research, by field proofing research to give it real world relevance. Any similar program needs a Wally, however they are very hard to find." Don Lobb, Honorary TAP member

"When Wally Findlay retired last June from Agriculture Canada, those involved in soil conservation in Ontario were both happy and sad. On one hand, Wally has earned his retirement. At the same time, his efforts in the field of conservation and soil fertility will surely be missed. All are pleased that he will be continuing to work with SWEEP until the program is completed.

Wally, a native of Nova Scotia, came to the Harrow Research Station in 1957, shortly after receiving his Ph.D. at McGill. All his work since that time has been related to soil fertility, with particular emphasis on phosphorus. When the SWEEP program to reduce phosphorus in Lake Erie was being organized, Wally was an obvious choice to be one of the program's planners.

After the overall planning was completed, Wally was given responsibility for the research component, called Technology Evaluation and Development (TED). On-farm research was a key component of the program. It was felt that research should be conducted in farmers' fields, and that farmers should be encouraged to be active participants, not only in the doing of the work, but also the planning of what was needed. This type of research was to complement, not replace, the research being carried out at colleges and universities. It was a relatively new approach -- and it worked. The innovative farmers who were most interested in soil conservation became Wally's buddies, asking him questions and answering his in return. Research in laboratories, in plots at research stations, and in farmers' fields all contribute to our overall understanding of crops, soils and erosion. Answers have been found, but each answer generates more questions. "This is a healthy sign," says Wally. "For many problems there are no finite answers. As more is learned, more unknowns are discovered."

Wally Findlay has contributed much to our understanding of soil fertility in Ontario." Contributed by Herb Norry to SWEEP Newsletter Issue 11, Spring, 1992

Wally has been a key figure in SWEEP from long before SWEEP came into existence until its conclusion. Other than TAP's Scientific Advisor, Mike Hicknell, he is the non-TAP person who has attended more TAP meetings than any other, who has used the services of TAP more than any other, and who has been called upon by TAP Executive members more often than any other for informal, friendly consultation and advice. He is a big man.

4.2.6 TAP MEMBERS LIKED TAP

"As a person who attends quite a lot of meetings, and generally hates them, I found that I really enjoyed TAP meetings, and looked forward to them. The reason for this has been the diverse backgrounds and experience of the members. The meetings were always interesting, and I learned something new at each one. Everyone's opinions and comments were respected by the others, and there was an incredibly positive feedback occurring at most meetings. Each member's experience or knowledge was complementary to that of the other members, with the result that a discussion usually led to a clearer understanding of the issue by everyone, and a consensus and recommendation usually came naturally from this situation."

Dick Coote, TAP Member

"Although my view as a TAP member may be biased, I like to think that as a group we were helpful to management as well as to TED and the Pilot Watershed Program. We all certainly learned a lot, enjoyed the company and, for the most part, enjoyed our work. I think a group of reviewers or interested and involved observers is absolutely necessary to a large program such as SWEEP. The structure and function of such a group would, of course, have to be tailored to the program.

Susan Weaver

"For me, TAP was an exciting forum ...." Dr. Rob McLaughlin

"Serving on TAP has been both educational and rewarding. It has also opened my eyes to all the complexities facing modern agriculture. At the time I joined TAP I thought I knew quite a bit about modern farming practices, and I did, but did not appreciate fully all the different factors confronting today's farmers. New or different practices have created problems that we did not have before. This has forced us all to re-evaluate what we have been doing and to come up with new answers. To be involved first hand in some of this work conducted under the SWEEP program has indeed been rewarding."

Lars Skjaveland, TAP Member

"This is the first time that I have ever had the opportunity of belonging to a group such as TAP and I liked it. It seems to me that it is a good idea to have a multi-disciplinary groups such as TAP to review the research that has been done for SWEEP under contractual arrangements. Because we have input from so many sources, we are able to assess, not only the research itself, but also how and where the research might be useful and how it should be promoted. I have enjoyed being a part of TAP."

Michael Goss, TAP Member

"I almost said "No" when I was asked to be a member of TAP because I had so much work to do at the time. Thank goodness I didn't. Being on TAP has been a wonderful experience. I believe that we have been a big help for the SWEEP program, I know that I have learned a lot and the other members of the panel are so knowledgeable, so easy to get along with and such good friends. The biggest problem now is that I say yes to everything because I don't want to risk missing something good."

Jack Rigby, TAP Member

"TAP kept the SWEEP program honest and relevant - it is an essential component of any new similar venture."

Don Lob, Honorary Member of TAP

TAP Members liked TAP because:

1. They believed that what they were doing was important for the success of SWEEP.

2. Managers were generous and sincere in their expressions of appreciation.

3. New ideas and new viewpoints were constantly emerging as a result of the interaction of panel members.

4. Panel members could disagree without being disagreeable.

5. From the beginning, executives put a high priority on developing esprit de corps.

6. There was time for all to speak and others listened.

7. For the most part, panel members were participating to complement the views of others rather than to secure personal recognition.

5.0 RECOMMENDATIONS & SUGGESTIONS FOR IMPROVEMENT

1. Future research-related programs of government that impact directly on the farm community should be reviewed on a regular basis by a multidisciplinary panel along the lines of TAP. This group would provide management with peer group comments on issues important to the project. Such panels do exist, especially where specific commodities are involved, but they are by no means a feature of all programs.

2. Cooperation between government, ministries, researchers, agribusiness, farmers and organizations, etc. was one of the big side benefits resulting from SWEEP., This benefit was so great that every effort should be made to ensure that cooperation is featured in future programs.

3. Farmer members on TAP were particularly valuable because of their understanding of rural issues, Farmers should be included in future panels dealing with agriculture, rural issues, or the environment.

4. Developing a strong esprit de corps was a valuable accomplishment in TAP and should be a goal for similar panels.

5. If possible, panel members should serve for the duration of the program.

6. A narrow-based narrow-focused, very specialized panel has advantages if the problem being addressed is of the same nature but a multidisciplinary panel is better for problems with broad boundaries.

7. Particular attention should be given to the start-up phase of future programs. Over and over again in government programs, the mechanics of getting the ball rolling and the first contracts signed, seem to result in the "loss" of the first year. This, of course, has consequences down the line in the way money is spent.

8. Five years is too short a time period for most research dealing with soils.

9. Provisions should be made to finance worthwhile projects beyond their original termination date.

10. The research, development and delivery of SWEEP has shown that "systems R & D" is required. However, the system gets too large, too costly and has too many variables. It will be better to look at a part of the systems several components. The farmer can and will put the components together into a sustainable agriculture system.

5.1 FUTURE RESEARCH PRIORITIES (See Appendix F)

6.0 SUMMARY

The Technology Assessment Panel of SWEEP came into being to review, assess, plan, advise, recommend and promote. TAP was to be both proactive and reactive.

TAP was an autonomous body. Members agreed that the success of SWEEP had to be their primary goal and that other considerations had to be secondary.

TAP did not have power in itself. It would achieve success if it were able to convey information, ideas, viewpoints, feelings, etc. to management so that management would be in a better position to make informed decisions. TAP members agreed that all reasonable ideas of TAP members should be conveyed to management regardless of whether or not consensus had been secured. This was done. It was recognized that management might not have time to deal with all ideas so summaries of the most relevant were prepared and sent to management in Reports for Management.

Since TAP members were volunteers who could find excuses for not attending TAP meetings if they so wished, and since TAP meetings would be less successful if fewer attended with resulting less exchange of ideas, TAP executive put a high priority on having meaningful, pleasant meetings and on developing esprit de corps. Comments from members indicate that the tactic worked.

In this report, we have presented information that individual TAP members considered to be important. Some parts of SWEEP may be overemphasized and some missed. That can happen.

TAP has been successful if it aided in the success of SWEEP. That is something that cannot be measured, especially by the one being measured. All that we can say is, "We did our best."

APPENDICES

APPENDIX "A"

FINAL SWEEP and TAP MEETING
March 31, 1993
College Motor Inn, Guelph, Ontario

From TAP:	Bruce Shillinglaw	Art Bennett	Bill Kilmer
	Susan Weaver	Dick Coote	Lars Skjaveland
	Clinton Pottruff	Jim Myslik	Jack Rigby
	Adam Hayes	Herb Norry	
From CIB:	Doug Robinson	Helen Lammers-Helps	
From Ministry of Environment:			
	Jim Eddie	Karen Jones	
From Environment Canada:			
	Len Kamp	Murray Brooksbank	
	Wayne Archer	Rimi Kalinauskas	
From OAC:	Bev Kay		
From OMAF:			
	Vern Spencer	Howard Lang	Maxine Kingston
	John Schliehauf	Martin Bohl	Doug Aspinall
	Peter Roberts	Jim Weeden	Galen Driver
	Brent Kennedy		
From Ag. Canada:			
	Sharon McKay	Fred Mooney	Gary Nelson
	Mike Hicknell	Bob Anderson	Sharon Burke
	John Cauley	Wally Findlay	Greg Wall
	Roger Thompson		
From Private Contractors:			
	David Charlton	Valerie Alder	George Schell
	David Cressman	Jane Sadler-Richards	Don Lobb
	Bob Walker	Andrew Laycock	Joe Omelian
From Canada Wildlife Services:			
	Louise Maynard		

FINAL SWEEP and TAP MEETING
March 31, 1993
College Motor Inn, Guelph, Ontario

Some 50 persons gathered for luncheon and an afternoon program. The group included persons who had been involved in SWEEP plus some who are playing leadership roles in programs under the Green Plan. Chairman for the meeting was Art Bennett from TAP.

No press were in attendance. Persons who had played leading roles in some SWEEP programs were each given the opportunity to tell about the process that had been used in the program with which that person had been involved. General results were desired: What had been done well? Where could improvements be made? What advice do we in SWEEP have for programs of the future.

In the summary of the day's activities, we have avoided a chronological account of everything that was said. As an alternative, we have tried to blend together the major ideas of the day and have taken the liberty of adding editorial comment to bind the blocks together.

In her "last words" at the end of the program, Sharon McKay, Ontario Director of the Agri-Food Development Branch of Agriculture Canada said "The best of the cooperative spirit has been brought out in this program. In my 18 years with the government, this is the finest cooperation that I have seen. We have established a strong base for future initiatives."

SWEEP was a federal/provincial program that directly involved Agriculture Canada, the Ontario Ministry of Agriculture and Food, Ontario Ministry of the Environment and Environment Canada. Involved as well were farmers, agribusiness, public and private researchers, conservation authorities, universities, colleges, farm organizations and the general public.

Increased cooperation between stakeholders was one of the great side-benefits of SWEEP that was noted in the TAP report. Speaker after speaker at the final meeting referred to cooperation and partnerships. David Charlton, representing private contractors, told us that in a successful partnership, partners make use of the strengths of other partners and cover up for their weaknesses. Jim Eddie of MOE told us that when he wanted to visit a farm family involved with a project, his local guide asked for the opportunity to go ahead to warn the farm family that someone from MOE was coming and to assure them that the visitor was all right. MOE has great strengths to contribute to a partnership but so far have not been able to develop the strong trust in rural areas that OMAF has developed.

Stakeholders in SWEEP and stakeholders in other projects that may come in the future, may have basic goals that are very similar and may also have contributing goals that are very different. In other words, they may think alike on the big issues but have differences in the small ones. More success will be achieved if lessons learned in SWEEP are used; if partners recognize other partners as colleagues rather than competitors; if partners seek for good points in the thinking of others; if partners make use of the strengths of other partners and cover up for their weaknesses.

SWEEP has been a successful program. Wally Findlay, one of the original architects of the program, and the lead-off speaker spoke of some successes. Galen Driver, Co-Chair of the Working Committee during most of SWEEP's existence, told us at the end "This is a happy occasion. It is not the end. It is just the beginning. A lot of positive things have happened. We are in a far better position that we have ever been before to address the important agricultural and environmental issues that are facing the whole world. Because of SWEEP, we have far more and far better qualified people. Even five years from now, we will not have the benefit of SWEEP tallied up. We have cultivated working ties with other agencies, other ministries and between the provincial and federal governments. We could no longer go our separate ways. This has been a wonderful adventure."

In between the beginning and the end, we heard a series of reports of various programs and projects, about successes and disappointments. Since those who might have input into future programs were present, it was important to think of where improvements could be made.

Disappointments were due to many causes. Some of these, like the weather, were outside the control of the planners. The short time period was a recognized problem from the start but beyond control. Lag time may have been underestimated. "You can't start a project on May 1 and expect to be in business on June 1." Programs are most successful when all partners, from administrators and researchers to farmer cooperators, have input. This takes time.

Some disappointments, as might be expected, were due to misunderstandings. "In some cases, we should have spent more time on methodology to make sure that everyone understood what was happening and why." Cooperators are more apt to cooperate well if they know the plan and if they are convinced that their cooperation will be meaningful. Communication involves listening as well as speaking, reading as well as writing. Unfortunately, some do not like to listen.

For every disappointment, there were joys that far exceeded expectations which are well summed up in a quotation presented to the meeting by Wally Findlay.

> ... There is always serendipity. Remember the Three Princes of Serendip who went out looking for treasure? They didn't find what they were looking for but they kept finding the things just as valuable. That's serendipity and our business if full of it. George Merck, TIME, Nov. 3, 1951

Benefits from SWEEP have been achieved and a solid base has been left for those who will come after us.

APPENDIX "B"

TAP Executive Meeting - 9:00 a.m., August 26, 1986,
Perth County O.M.A.F. Board Room, Stratford.

Present: Art Bennett; Murray Miller; Bruce Shillinglaw;
Herb Norry

Herb Norry announced that Art Bennett had been asked to serve as first chairman of the Technology Asessment Panel and asked him to begin his job as chairman.

"What are we to accomplish at this meeting" was first order of business. The most urgent need is to make more definite plans for the proposed next TAP meeting on September 17th and 18th, in London. Work plans and budget prepared by Herb Norry should be reviewed and modified. Some brainstorming should be done relative to possible activities of TAP in the months and years ahead.

Update re the Sweep Program was the next item. There had been unexpected delays in some of the proposed SWEEP program particularly the one concerned with watershed studies. As a result the Working Committee will have fewer proposals to present to the panel on September 17th and 18th. Hon. John Wise, Minister of Agriculture had sent letters to prospective panel members inviting them to serve on TAP and many have already responded affirmatively. The report re the Soil and Water Conservation Information Centre has been presented to the Management Committee.

Notes taken at the last pre TAP meeting on June 23rd and 24th, were reviewed and approved. Further discussion on some items was as follows:

Overview - Murray Miller has the ideas garnered at the last two meetings but has not had time to put them in order. He has been in touch with persons in Ecological Services Limited and has been informed that, as soon as their contract is signed, they plan to convene a workshop to develop an overview similar to the one that we are working on. They intend to invite TAP members to participate. It was unanimously agreed that TAP should be prepared to co-operate fully with the contractor on this activity. Since Murray Miller will be in China on September 17th and 18th, it was agreed that we should not deal further with the Overview at that meeting and that we should schedule the next meeting to coincide with the contractor's Workshop.

Organizational and Operational Plan for TAP - This report has been presented to the Management Committee. It was agreed that members of TAP should receive copies and that some time should be allotted at the September 17th and 18th meeting to deal with selected parts and to give members the opportunity to comment.

Conservation Information Centre - There was unanimous support for the recommendation in the "TAP Report" that a Conservation Information Centre be established. Since a report was presented at our last meeting, there is no immediate need to deal further with this topic unless an opinion of TAP is solicited relative to specific points.

Upcoming Events - There is a great need for more co-ordination of information relative to upcoming conservation events. As a start we should ask TAP members at every meeting to share information re coming events. This information can then be shared with others.

Kent Conservation Day, August 12th, at Jack Rigby's farm and Huron Conservation Day, August 20th, at Gordon and Paula Lobb's farm -

Bennett, Miller and Norry had attended the Kent Day and Shillinglaw and Norry the Huron Day.

Weather was excellent on both days, so were the host farms, the facilities, the speakers, the exhibits, the tours and demonstrations and the lunches.

Speakers at the Kent Day were: Mike McKenzie, a farmer and herbicide salesman from the U.S.A. who spoke on Herbicides and Conservation Tillage; Joe Whitney from Spencerville, Ohio, who spoke on Planter Set Up and Equipment Modification; and Max Ricker, a farmer and drainage contractor from Haldimand County.

Speakers at the Huron Day were: Senator Herbert Sparrow, the author of Soils at Risk; Vern Spencer, O.M.A.F., who spoke on the SWEEP program; and Bob DeBrabandere a conservation farmer.

A common weakness of both programs was the shortage of farm operators in attendance. What were the reasons? Good weather? Busy season? Insufficient promotion? Full day meeting rather than a twilight meeting or morning meeting? Lack of involvement of other organizations or networks who might have complemented the efforts of those in charge?

TAP Executive, unanimously agreed that the shortage of attendance at the excellent meetings focused our attention on the need for promoting the fullest cooperation between groups, organizations, governments, ministries, networks, etc., who are or who could be promoters of soil conservation and/or the minimization of water pollution.

Meeting September 17th and 18th - Discussion of reports submitted by the Working Committee will be the main feature. If time is available some of the following should be considered:

(i) Visit to the Upper Thames Conservation Authority accompanied by an outline of the work that the authority is doing
(ii) Interaction with OSWAC
(iii) Review of report "Organizational and Operational Plan of TAP"
(iv) Future plans and budgets
(v) Presentation by an agricultural consultant (such as Pat Lynch) and by an over-the-counter salesman advisor to gain a better appreciation of their problems and opportunities

Other ideas that should be considered:

(i) Newsletter to TAP members and selected others
(ii) Capsuled information about panel members
(iii) Over a period of time, (2 or 3 per meeting or newsletter) more detailed information about each panel member
(iv) A schedule of coming events re conservation. (This would be successful if those with information supplied it regularly)
(v) Should TAP be a focal point for events such as the "leading edge seminars" held during recent years and sponsored by individuals such as Don Lobb and Howard Lang. (Don Lobb had suggested that TAP might assume this role)
(vi) Representatives from TAP should be selected on a continuing basis to go on fact find missions to conservation events outside our area

Murray Miller reported that the University Senate had approved a Centre for Soil and Water Information. This Centre is being set up for internal purposes and should complement rather than compete with the proposed Soil and Water Conservation Information Centre of SWEEP.

The chairman and secretary manager agreed to finalize the agenda for the September 17th and 18th meeting and to send information re the meeting to panel members as soon as possible.

The date for the next executive meeting will be determined following the next TAP meeting.

THOUGHTS ABOUT TAP NOVEMBER 1987 by Herb

TAP's most useful role in SWEEP is as an assistant to management, i.e. the Management Committee, the co-chairmen of the Working Committee and the scientific authorities. TAP is composed of talented people from agribusiness, government, universities and the farm community. Not only are TAP members a network in themselves, they are also tapped into a host of other networks throughout South-Western Ontario. Members can be extra eyes, ears and sources of opinion for those who must manage programs.

If a program manager wished to conceal from TAP problem areas and/or sensitive issues, he could likely succeed for a period of time even though he were reporting to TAP on a regular basis. The kernels that should be questioned could be successfully concealed in great quantities of chaff and big words.

The total program can be best served if program managers view TAP as a source of help, suggestions and constructive criticisms; if managers point out the areas that are weak or sensitive or that should be improved; if managers ask specific questions that they wish TAP to address. Program managers know that TAP wants to help and the spirit of cooperation at the present time appears to be excellent.

TAP should not be afraid to make unresearched statements, some of which might prove to be inaccurate. Management should encourage and even order TAP to do this. Is it right for an assessment panel to make an assessment that might be incorrect? It is almost sacrilegious to think such a thought let alone write it. Needless to say, TAP wants very much to make assessments that are correct. TAP also wants to be of as much help as possible to the total SWEEP program.

There are many issues where answers to problems are not obvious and clear cut, where an answer is not either all right or all wrong. The best answer may be merely a little bit better than the second best. TAP is fortunate in having members who are talented in many ways but each has specialties and each has weak areas. It would be difficult to pass opinion on dozens of issues if actual issues were not clear cut to begin with and if consensus were required before an opinion could be forwarded to management. The alternative is to record as many as possible of the opinions that are expressed and to forward these expressions of opinion to those who may be able to use them.

The latter is the approach that is being used in TAP. A weakness is the possibility that a recorded opinion might be unacceptable to the majority of TAP. Managers should be aware of this. A strength is the fact that some points of view raised for consideration, would never be heard if records included only points about which consensus had been reached.

Boundaries for TAP activity: Functions of TAP are recorded in the Organizational and Operational Plan. That is where TAP's activities must be concentrated.

Members of TAP come from many areas and several disciplines. They are tapped into many networks. What should happen when members of TAP receive information that is of importance to SWEEP but borderline as far as TAP functions is concerned? TAP should try to avoid getting involved in areas outside its boundaries. However, the success of SWEEP is much more important than the boundaries of programs. It would not be right to keep silent and avoid passing on to co-workers information that might help such co-workers in their programs.

TECHNOLOGY ASSESSMENT PANEL

REPORT for Management Committee December 6th, 1988

Observations below are based on meetings of November 24-25 (Minutes attached), August 3-4 and on Executive Meetings held August 31 and September 28, 1988.

1. TAP recommends that OMAF nominate a replacement for Dr. Charles Baldwin. The biggest benefit of TAP comes more from the points raised in the interaction between members than by the short answer decisions reached. Interaction drops greatly when members decrease beyond a certain point. Even though TAP members are enthusiastic and conscientious (five with perfect attendance in 1988 and three more with 90%), there are times when busy people just cannot attend and September meeting had to be canceled because too many were in that category.

2. *The Farm Level Economic Analysis Program* was the subject of a letter to the Management Committee following TAP's August 3-4 meeting. The worries of TAP were certainly not about the competence of the contractor, but about possible inadequacies of input data. The co-chairmen of the Working Committee arranged for a valuable committee meeting at which the contractor and the scientific authority had the opportunity to become more aware of TAP's concerns. Contractor is assessing potential input data to determine whether it meets the requirements for a worthwhile report. OMAF have volunteered unrestricted use of the Tillage 2000 data regardless of whether or not it is from the part of T-2000 included in the TED program.

3. *Sources of Motivation in the Adoption of Conservation Tillage*. This report under the Socio-Economic Analysis Program was reviewed by TAP. It was generally agreed that the main point of the report is the testing of the methodology used rather than conclusions re the source of motivation. This report will be interesting mainly to other researchers. TAP recommends that the report be circulated in the scientific and academic community.

4. *Conservation Information Centre*. Several members expressed diverse views re this and a motion was passed asking that the secretary write a letter to the Minister outlining the views. To date this has not been done. The sentiments behind the motion were that TAP should assist the MC wherever possible and that the proposed letter would be a help. TAP members do not want to take actions that are damaging rather than helpful to the over-all objective of SWEEP.

5. *Dealing with volumes of information*. This topic was not on the agenda but generated considerable excellent discussion. A recommendation is that SWEEP adopt some method of numbering reports before it is too late. Already the number of reports and the similarity of appearance of the reports is creating filing problems for all semi-organized persons.

Filing is a useless exercise unless we keep in mind that finding is the main objective. Much good information on Conservation is available in Ontario and in other parts of the world. Assessing such information to determine what is most valuable in our efforts to promote conservation is one challenge, transferring the information or technologies to action areas in another. Unfortunately we are likely to fail to save information resulting from the practical application of a combination of research information, observations of past experience, imagination and common sense.

TAP recognizes this as both a problem area and an opportunity area with greater emphasis on the latter. It would appear that there may be an interpreting and assessing gap between researchers, and farmers and extension workers who are closer to the point where information is used or rejected.

TAP is not sure whether this area is satisfactorily covered and if not what should be done. The topic was left in a vibrant unfinished state.

P.S. December 16 - TAP Executive discussed the idea of sending covered copies of reports to TAP prior to assessment, then TAP members will not end up with two copies. From a pragmatic point of view, what harm would result.

6. *Review of Implementation Plans*. All plans presented were reviewed. Scientific authorities who made presentations were able to gather opinions raised in the questions and comments. Greatest discussion centred on the TED program where suggestions were made for needed research. The topic *manure* is one that is raising greater concerns. We are fortunate that both Wally Findlay and David Charlton were present.

7. The question was raised as to when TAP will disappear. Present date is March 31, 1990. Wally Findlay said that the roll-up and wrap up at the end of SWEEP is a responsibility of TAP. Tillage 2000 is likewise scheduled to end in 1990 but Galen Driver hopes funds will be found so that more data can be generated.

8. Bruce Shillinglaw was elected Chairman of TAP replacing Art Bennett who resigned and who will continue to serve on TAP as Past Chairman. Bill Kilmer was elected Vice-Chairman.

9. Questions were raised about the choosing of an April date for the proposed MPP tour. Greater possibilities of mud and bad weather were mentioned. Consensus was not sought.

APPENDIX "E"

SAMPLE IMPLEMENTATION PLAN

TECHNOLOGY ASSESSMENT PANEL

1991-1992

TAP COMPONENT

1. The Technology Assessment Panel to maintain its 15-member multidisciplinary composition and actively involve its full membership in both a proactive and reactive role.

Performance Measures

- constructive nature of its work,
- acceptance of advice by other components of SWEEP,
- all members participate actively,
- on selected topics Sub-Committees to be formed to proactively investigate these areas of interest.

Milestones

a) In conjunction with Project Manager, ADB (Ontario) conduct a mid-term review of 1991-92 activities of TAP by October 1, 1991.

b) Management Committee kept informed of TAP findings and recommendations on a quarterly basis.

2. The Technology Assessment Panel to provide timely reviews of all technical plans for federal Sub-Programs, and the progress of projects and technical results and to recommend and priorize technologies for evaluation and/or development.

Performance Measures

- timeliness of TAP comments,
- constructive nature of TAP comments,
- TAP to meet on a bi-monthly basis.
- the implementation plans of all federal Sub-Programs reviewed.

Milestones

a) draft Sub-Program Implementation plans reviewed and commented on by TAP by November 30, 1991.

b) members to be updated on the progress of all federal projects and research studies at each TAP meeting.

3. The Technology Assessment Panel to maintain established liaison with innovative farmers.

Performance Measures

- TAP to continue to utilize their contacts with innovative farmers to gather information about new and untested conservation technologies or systems,
- innovative farmers included in fact finding trips.

Milestones

a) Three members of TAP to attend annual workshop of innovative farmers and report successes and problems to subsequent meetings of TAP; this by February 15, 1992.

b) TAP to undertake field trip(s) to visit the farms of at least three innovative farmers during the 1991 growing season.

c) In conjunction with management contractor and scientific authority, TAP to visit two co-operating farms on one paired watershed of the Pilot Demonstration Watershed Sub-Program by March 31, 1992.

d) In conjunction with pilot watershed sub-contractor, invite representative farmers from both test & control sites of the 3 pilot watersheds to a TAP meeting so in this way TAP members can be aware of their progress/problems.

4. The Technology Assessment Panel to continue to search for and help develop technologies for testing that may help farmers in Southwestern Ontario to reduce soil degradation. The 1991/92 emphasis will continue to be on sustainable and/or alternative agricultural systems and environmental concerns.

Performance Measure

- reports of field trips provided to TAP members at large and to SWEEP Sub-Program managers.

Milestones

a) Fact finding teams to attend three Conservation/Environmental Conferences and/or field days by March 31, 1992. Suggestions to date include a trip to a U.S. conference to determine successes and problems associated with cross compliance and other regulatory initiatives.

b) Two more sustainable and/or alternative agricultural systems will be looked at by March 31, 1992.

c) fact finding teams to visit farms of three farmers involved in sustainable and/or alternative agriculture by March 31, 1992.

5. The Technology Assessment Panel to continue to review soil and water research studies to be undertaken in Ontario and to assess research results from federal, provincial, university and the private sector as well as international work.

Performance Measures

- TAP to have received and critically commented on all research reports produced by the federal Sub-Programs and results assembled from other sources.

Milestones

a) TAP to have scheduled two speakers at TAP meetings and visit at least two more research sites in 1991/92 to become aware of research results, research underway and research plans relative to soil and water degradation. It was suggested that i) an inspector for the Ecological Farmers Association of Ontario address the Panel regarding the work of the association; and ii) the Panel continue to look at the REAP field trials.

b) TAP to provide to the SWEEP Management Committee their comments regarding the publication and distribution of all SWEEP reports to be presented to the Panel in 1991/92. Refer to page 24 for a listing of the potential TED studies which will be reviewed.

c) TAP on the advisement of the Management Committee to review the wrap up of SWEEP and suggest ways and means of transferring SWEEP resources results in Ontario.

d) TAP to review the list of soil and water research studies to be undertaken by OMAF in 1992 by January 31, 1992. A suggestion is to invite the chairman of the Soil, Water and Air Sub-Committee of the Ontario Agricultural Services Co-ordinating Committee (OASCC) to discuss research priorities proposed for 1992.

Future Research Priorities

Priority A (the numbers do not represent a ranking of priorities)

1. Another crop residue survey should be conducted to see if the objectives of SWEEP have been met for Ontario. (Report # 6)

2. Further research is needed to determine the effect of tillage on infiltration, run-off, macro pores and other soil hydraulic properties at different locations with varying soil types, management histories, etc. (Reports # 18 & 37)

   The influence of soil cracking on transmittal of water and agricultural chemicals beyond the root zone. Options such as periodic irrigation or blocking the tile drains during the summer months could be investigated. (Report # 34)

   Initiate a study to see how different tillage systems affect hydrologic response of watersheds and how this will impact herbicide transport and loss. (Report # 60)

   Better standards, with particular emphasis on design and field variability, for evaluating conservation technologies with rainfall simulation should be developed. (Report # 54)

   There is a need to develop reliable groundwater and run-off monitoring methods and equipment for use during the range of climatic conditions experienced in Ontario. (Report # 49A)

3. Continue the evaluation of the 58 commercial corn hybrids under the different tillage systems for another year (three years total) and correlate it to Dr. H. Hope's laboratory work to develop recommendations for corn hybrids on the Ontario Corn Committee performance list for no-till growing conditions. (Reports # 22 & 59)

4. Some of the weed control studies could use another year or two to verify the results. (Report # 32)

   a) burndown of established alfalfa in no-till soybeans
   b) burndown of red clover in corn
   c) control of established alfalfa in no-till corn
   d) glyphosate antagonism when tank mixed with residual herbicides on no-till soybeans
   e) effect of additives on residual herbicides for annual weed control in no-till soybeans
   f) weed control under various tillage systems
   g) effect of residual 2,4-D on soybeans
   h) effect of adjuvants (pH,etc.) and water quality on herbicide performance

5. Study the rehabilitative effects of conservation tillage on degraded soils. The rehabilitation of degraded soils in a broader sense should also be studied on a representative range of soil and landscape conditions across Ontario. These studies could complete the much needed work left undone by the successful T-2000 program. (Reports # 38 & 45)

6. Further research is needed into management of mulch tillage systems in poorly drained clay soils. (Report # 40)

7. Much more information is required on the uptake and release of nutrients from different cover crops, and the influence of other factors on this process such as weather and soil type. (Report # 43)

   The study recommends further research, including monitoring the amount of nitrate nitrogen being contributed to the corn crop from the red clover and initiating field scale studies on the fall kill treatments. (Report # 36)

8. There is a lack of information available on soil fauna in different agroecosystems. We need to develop sampling protocols and to develop a database of information on soil life as indicators of soil quality. (Report # 47)

   Future research into soil life should differentiate, where possible, amongst soil organisms which are beneficial to agriculture and those that are not. It would be interesting to see differences amongst different tillage systems examined. (Report # 30)

9. Examine tillage erosion on a broad range of soil types to determine the effects of soil texture and soil moisture content on soil translocation. (Report # 55)

10. We need to develop an understanding of the cycling of carbon, phosphorous and nitrogen in cropping systems. (Reports # 17,51 & 53)

    A comprehensive research program is required to determine the fate of nutrients from all sources (commercial fertilizers, manure, urban organic wastes, etc.) in various tillage and cropping systems over time. Site-specific recommendations for rates, combinations of materials, timing of operations and cultural practices then could be developed to ensure cost-effective production with minimal environmental impact. (Report # 58)

    Further study is needed to better understand soil nutrient dynamics under rye mulch. There is a need to determine if early season deprivation of nitrogen by the rye cover crop affects final soybean yield. (Report # 57B)

11. There is a need to determine the source of soluble phosphorous in conservation tillage systems (crop residue, surface soil) and further study the effect on total phosphorus losses in poorly drained soils. The study should also include different soil types and

topographic profiles to see how they affect phosphorus and herbicide movement. (Report # 60)

12. Research into allelopathic effects of different residues for no-till corn study should be carried out for a longer period of time and on several soil types.(Reports # 21 & 53)

    This study considered certain volatile fatty acids and phenolic compounds, whereas other compounds such as the volatile C_6 through C_9 organic compounds could be examined. Future research should consider the dynamics of both the production and utilization of phytotoxin compounds during decomposition of crop residues. (Report # 56)

13. The Tillage 2000 economic data from the five years of the study could be analyzed. (Report # 11)

14. The economic analysis could be repeated with a large group of farmers with several years of experience to give a more realistic picture of the economics of conservation tillage systems. More studies need to be done into the economics of conservation, the risks involved and the costs of switching systems. (Reports # 10 & 11)

15. There is a need for more research into integrated approaches to modelling resource, farm management and economic data for the purposes of extension and program planning. (Report # 3)

Priority B (the numbers do not represent a ranking of priorities)

1. The model developed in the Land Reshaping of Lowland Clay Soils study should be further evaluated quantitatively making use of the parameter selection technique developed. At the same time, the phosphorous loss component of the model should be evaluated using this modified technique. The modelling of surface run-off from agricultural lands needs further work. (Report # 49B)

2. Row crop planter modifications for corn production within conservation tillage systems requires further evaluation on a wider variety of soil types over several years. Research comparing various drills for no-till under various cropping and soil conditions. Field scale studies using traditional harvesting equipment are recommended. (Reports # 39 & 41)

3. Further testing of the cross-slot opener should be done to fine tune it (seed and fertilizer placement) for field conditions. (Reports # 42 & 44)

4. Further develop the computer-based farm decision support framework model for use as an extension tool as outlined in the report. (Report # 33)

5. Conduct field studies to examine the effects of seed depth on weed seed germination and mechanical methods of weed control. (Report # 19)

6. Similar work should be initiated to determine if other areas of conservation (pollution control, nutrient management, etc.) follow similar trends of adoption and diffusion. (Report # 8)

   This approach is appropriate for further research regarding other areas in agriculture and environmental quality. A follow-up or complementary study to examine the adoption of waste, pest, water and nutrient management would provide useful direction for future programming. (Report # 9)

7. The structure of perceptions and motivation regarding agriculture and conservation is complex and variable. Additional studies using similar techniques should be tried again in order to test, refute and or improve their model with standard hypotheses on a larger sample in order to draw reliable conclusions regarding perceptions and motivation with respect to the adoption of conservation farming practices. It would also be instructive if future studies of a similar nature examined the adoption of conservation farming practices with respect to farm enterprise type. (Report # 7)

8. Refinement of visual methods for quickly assessing the extent of compaction and compaction hazard. Compaction research trials evaluating the actual extent of yield reduction in corn and soybeans. (Report # 4)

9. An integrated research program is needed to examine erosion and other degradation processes and the impact of current and remedial practices on soil quality on Ontario cropland. From this, knowledge could be gained about the relative impact of tillage, water and wind erosion on a variety of representative soil and landscape conditions. (Report # 38) (see Priority A-5 for reference)

10. More work is needed to determine if the three dimensional mass balance of cesium gives a more accurate estimate of soil and phosphorous movement within field boundaries than the two dimensional. (Report # 45)

11. There is a need to determine what processes cause phosphorous loading to surface water, if the majority of the soil that does move remains in the field. (Report # 45)

12. Update the Conservation Tillage Handbook to include new equipment/modification ideas as technology evolves.

13. The impact of vertical stratification with respect to nutrient loss due to soil erosion needs further study. Horizontal stratification on fields with known histories and similar cropping patterns should be examined. The impact of vertical nutrient stratification on plant growth and yield needs further study. Further study on the effects of specific management practices under controlled conditions. (Report # 35)

14. Should soil moisture conditions (excess or deficiency) in various tillage regions become an important issue, then future research should be directed at those soil and crop rotation combinations of concern. These combinations should, however, be representative of Ontario conditions and current practices. (Report # 29)

15. Continue research on additives (kelp and molasses) over a number of years to see if there is/is not a benefit and include an economic analysis. (Report # 26)

16. Conduct follow up weed surveys of corn, soybeans and winter wheat fields under conservation tillage five years later. (Report # 19A)

17. The Annotated Bibliography of Socio-Economic Soil and Water Conservation Research report identifies a number of areas that require further research. No further action required. (Report # 15)

18. More data from several storm events are required to determine relative effectiveness of terraces as erosion control measures. Further methods research and development is required to determine the relative effectiveness of erosion control systems. This will be of particular concern as increasing emphasis is placed on conservation and environmental farm planning in the very near future. (Report # 14)

IN PROGRESS

1. Research evaluating the best placement and timing of nitrogen applications in no-till would be useful. At least three years data is required on various soil types to study the effects of split applications of nitrogen on corn in no-till and ridge till systems as this study was conducted before the soil nitrogen test was available. (Reports # 25 & 28)

2. It should be documented whether or not TED research hit the target audience and what further research needs should be addressed to further conservation farming and environmental sustainability. (Report # 2)

3. A follow-up survey of southwestern Ontario farmers for the evaluation of SWEEP is planned at the end of the SWEEP to contrast results from this study. (Report # 5)

Prepared by the Technology Transfer Committee in consultation with the Technology Assesment Panel (TAP) of SWEEP.